THE NEW JERSEY FORESTER.

A Bi-Monthly Pamphlet Devoted to the Development of Our Forests.

Edited by John Gifford, May's Landing, N. J.

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DURING the month of March, 1894, a bill was passed by the Legislature of New Jersey providing for a survey of the forest conditions of the State. That work under the direction of Prof. J. C. Smock, State Geologist, is in progress.

At Riverton, May 12th, 1894, tree-lovers, foresters and wood-land owners met to celebrate its passage. The New Jersey Forestry Association was then organized.

In September, 1894, the South Jersey Woodmen's Association was formed with the following objects in view:—To improve and protect the forests of the southern counties of New Jersey; to prevent all wanton and needless destruction of forests; to adopt such methods of cutting as will increase and prolong the yield of timber and cordwood; to insist upon the enforcement of the laws in relation to forests and the punishment of malicious and careless fire-setters; to encourage the planting and seeding of valuable trees on Jersey waste-land and elsewhere wherever practicable; and to encourage such methods of forest management as will tend to conserve and increase our water supply and protect the wild animals of the woods.

The First of January, 1895, the officers of the Avalon Summer Assembly met in Philadelphia. They unanimously decided not only to introduce a course in Forestry but to bestow special attention upon that department.

The South Jersey Woodmen's Association, the NEW JERSEY FORESTER and the Avalon Assembly are affiliated. This body hopes to become a part of the New Jersey Forestry Association which in turn should become, as well as all other State forestry organizations, a branch of the American Forestry Association, which we hope will favor South Jersey with a visit during the spring of this year.

Education in forestry is everywhere needed in this country. With this in view the courses of the Avalon Assembly have been arranged and this journal started, hoping to help to arouse public interest by the distribution of plain, but reliable literature.

No improvement in the forest conditions of South Jersey is possible as long as fires are allowed to burn without any systematic preventive measures. We copy the following encouraging clause from the Governor's Message:

"A matter so important as this certainly *demands* the attention of your Honorable Bodies. The State Geologist recommends—and I heartily concur—that as a protection against the occurance of forest fires, there be a more rigid enforcement of the law in relation to forest fires. Providing fire-marshals for every township of the third and fourth class counties; that 'fire-lines' be cut through and around large tracts of timbered land, and that the land bordering on highways and railroads be cleared and kept free from combustible matter. So far as legislation may be needed to carry out and enforce these suggestions and recommendations it should be enacted."

The education of the coming generation in the principles of forestry, the prevention of forest fires by proper policing, the buying and foresting of all lands unfit for agriculture and unprofitable to individuals by the Government, the encouraging of settlers to leave or plant woodlots on their farms and the planting of suitable trees along our streets and roads, in parks, botanic gardens and around our houses will quickly lead to the preservation and increase the value of our greatest inheritance—the forest.

What are We After?

By B. E. Fernow, Chief of Forestry Division, Washington, D. C.

Every newly settled country has its pioneering days, when in proportion to the population the fertile soil is plentiful, the stores of minerals and of the forest seem inexhaustable, and prodigality of Nature invites prodigality of man. The larger and richer the country the longer lasts this condition of things. In the United States this pioneering stage has lasted now for nearly three centuries and in some parts will last much longer; in other parts, however, where population is more dense, the fertile soil all occupied, the natural resources reduced and wastefully squandered, the second stage of civilization is approaching; the soil must be used with more discrimination, and each class and kind assigned to its most useful occupation; crops must be managed with more care and resources husbanded with more circumspection, if we would keep up a progressive civilization; economy of soil, of resourses, of opportunities must supplant reckless and wasteful use of these gifts, if a growing community desires to develop its future to best advantage.

Has New Jersey reached that stage of development? Is it entering into that phase of civilization, which necessitates rural economy, husbandry of field and forest?

This question those more familiar with local conditions will be able to answer. Judging from casual observation, conversations with the best informed, and a study of the changes in population and occupancy of the soil, I am inclined to believe that an affirmative answer can be substantiated.

We know that the forest resources of the State, as far as virgin supplies are concerned, are practically exhausted; we know that much of the young growth is worthless, large areas having been deteriorated and turned into useless brushlands by fire, cattle and careless treatment in general. We know that the northern hill country of the State has become densely populated and the question of equable and healthful water supply demands attention for a conservative treatment of the forest cover.

In the southern part of the State there are large tracts of sandy plains which are not fit for agricultural use. While scanty food crops may be produced on them with careful management, they are really fit only for other much better paying crops, which grow with much less attention and which instead of exhausting the soil improve it and in addition exert beneficial influences on the surroundings, namely, wood crops.

Although I believe, that if properly begun, even now a systematic management of wood crops, i. e., planting of valuable timbers would eventually be found to be as profitable an enterprise as it has proved under similar conditions in Southern France. It is not even necessary to go so far and expend any capital for a proper stocking of a timber crop. Simply letting nature alone will in many cases suffice, although with much longer time, to reproduce the valuable forest growth that once covered these lands. The crop will then naturally not be of as good quality and quantity of yield, as if man had applied superior skill and labor on it, but it will have cost nothing but patience and a "let alone" policy.

Let alone the fire! It is a dangerous plaything, even for grown boys. Put out the fire! If some fool or knave has made poor use of it. I may be wrong in my ideas of civilization, but when I travel through a country and see acres upon acres or even square miles of burnt forest and hear that every year these fires recur, mostly unchecked, I set that community down one peg lower in the scale of civilization; finding the people unable to take care of their property, perhaps ignorant of its value, nay, incapable or unwilling to perform the first duty of organized society, namely: to protect the life and property of its members. In a so-called self-governed country such a state of affairs appears to me rather a sad reflection upon the general intelligence of its citizens.

I will admit certain difficulties in coping with the fire fiend, especially in the thinly settled portions of the country, but an attempt to reduce its ravages should be made at least in every community that desires to be considered fully civilized and this can be done if a proper sentiment exists in the better element of the community.

While a national organization, such as the American Forestry Association, has for its main object the arousing and propogating of this civilizatory spirit in all parts of the country, State Associations can bring home the necessity of it more closely to a smaller community and with reference to the particular conditions and problems existing in the State; but as the problems and conditions in each locality differ, the practical and specific application of the general

ideas and principles is best done by local organizations with stated objects.

I hail, therefore, with delight and as a sign of the awakening of that healthy sentiment in the State of New Jersey the formation of the South Jersey Woodmen's Association, which in membership will show the existence and strength of that proper sentiment in the community for which it is established and in its publication contribute to an increase of the same and the spreading of rational ideas regarding local forestry problems.

Nay, it will be able, being confined in territory, purposes and problems to give more direct practical expression to that sentiment and if the commonsense views and propositions stated in its prospectus are carried into practice, serve as a model and nucleus for similar efforts in other parts of the State, a new era for New Jersey will be at hand. If the Journal is conducted on the same commonsense plan, it will be soon apparent to owners of forest property that sentiment and sentimentality in forestry matters are not the same thing and that forestry is nothing more nor less than the application of business sense and knowledge to the management of forest property for the greatest profit directly or indirectly.

When through the organization and efforts of the Association the danger of loss by fire has been reduced, then it will be time to show how by the judicious use of the axe the condition and usefulness of the natural woods may be increased and finally a rational system of forest management introduced. For forestry is not what its first advocates in this country believed it to be, the preventing of the use of the forest or the relegation of the same to one use only, namely, as a cover to preserve equable water conditions. Forestry is exactly the same as agriculture, it is the application of superior knowledge and skill to produce wood crops, managing them in such a way that the largest amount of the best timber is produced in the shortest time, or in other words, the largest income from the forest property without leaving out of consideration the other benefits accruing from a dense forest cover.

Just as agriculture at first is crude in a new country and only gradually becomes systematic and more and more rational—(it has in the United States in most parts by no means reached a high state of development)—so forestry in a new country at first must consist simply in a crude but commonsense treatment of the virgin woods and only gradually the finer methods will develop. Those that talk about introducing German forestry methods, know but little what these are; know not that we are not and cannot be ripe for those finer methods for a long time to come. But we are ripe for commonsense treatment of our natural woods. First prevent unnecessary damage from fire and cattle, then use the axe judiciously to cut out the less valuable trees and give better chance to the more valuable kinds and by the time that the young growth is becoming fit for harvest it will be of better composition and better yield than it could ever become by itself and will return the little care bestowed upon it a hundred fold.

I hope your Association and your Journal will be able to impress your wood-land owners with the rationality of such a policy.

A New Industry.

A new industry is about to begin in Vineland. The projectors claim to be able to produce a fine grade of linoleum from forest leaves, twenty-five to thirty per cent cheaper than from cork. They are offering $3.50 per ton for the leaves. Many men, women and children are busy gathering leaves. If this is successful it will furnish employment to a class that deserves it at a time when it is most in need of it. This may become another important minor product of the forest.

In referring to forestry work in New Jersey "Der Egg Harbor Pilot" says: "Dies ist ein Schritt in der rechten Richtung und wird vorzuglich von dem deutschen Elemente anerkannt werden, die den Werth des Schutzes der Forstern genau kennen"

We are glad that the New Jersey Game and Fish Commission recognises that the quantity of game depends mainly upon the amount and condition of our forests. We hope for its cooperation in the prevention of fires. For the protection of game many beautiful forests have been preserved in Europe.

The New Jersey Patriot in describing a severe fire which devastated a large area in Cumberland County in April of last year says: "The aggregate damage was many thousands of dollars, though it is simply impossible to give an intelligent estimate of the loss."

Owing to fire the publication of the first issue of the NEW JERSEY FORESTER was unavoidably delayed.

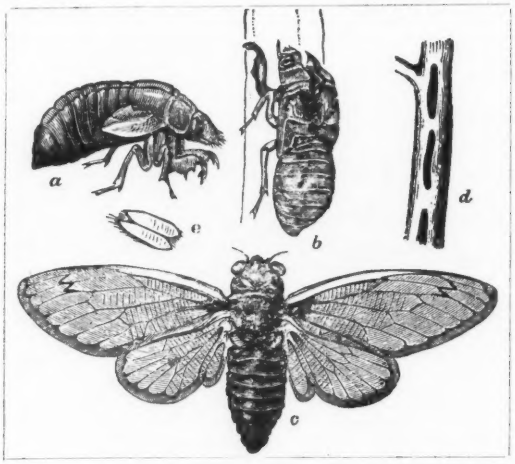
THE PERIODICAL CICADA.

or

Seventeen-Year Locust.

By Prof. John B. Smith,

State Entomologist.



There are some insects that force themselves upon the notice of even the most unobservant, and of such is the Periodical Cicada, commonly termed the "seventeen-year locust," and technically known to entomologists as *Cicada septendecim.* As its name implies the insect appears periodically, at intervals of seventeen years, and in most cases in enormous numbers. In figure c, we have a better representation of the adult insect than can be given by any verbal description, and if we add that the general color is black, the prominent eyes red, while the wings are transparent, with orange or yellow veins, we can form a very clear idea of how the insect actually looks.

Of course all unusual occurrences arouse comment, and intervals of seventeen years are quite long enough to bring our Cicada within the range of those subjects to which superstitious meanings are attacked and from which omens are to be derived. Thus, if we examine the forewings near the tip, we will notice, if we hold the insect rightly, that a very evident w is formed by a darkening of two little cross-veins; if this darkness is prominent or black it indicates war, and the insects are looked upon with dread. Even the unobservant notice these creatures, and their numbers, large enough in all conscience, seems doubtly large to them, and we get stories of the invasion of of or even the stoppage of trains. The popular term "locust" is always associated from the biblical stories with the idea of a seriously injurious pest, and as the insects are large as well as abundant, it is assumed that they are capable of doing enormous mischief. As it is also assumed that all creatures will do just as much mischief as they are capable of, we get any number of newspaper stories concerning the fields of grain that have been ravaged, the orchards that have been destroyed and meadows that have been browned and bared. That the stories are stories only, without the slightest basis of fact to support them does not prevent their being believed by perhaps the majority of those that read them. It is rare that the appearance of this species does not produce a crop of cases of people—usually girls or women—that have been stung and seriously injured, if not killed by the "locusts," Sometimes a single "locust" is credited with the mischief and sometimes it is a swarm;—but in all cases investigation failed to disclose even a vestige of truth in the stories.

The truth is, that a more harmless creature than the adult Cicada does not exist! It can only struggle wildly if you capture it and hold it in the hand, and can no more sting, than it can bite. It cannot bite, simply because it has no jaws: it cannot sting because it does not possess anything to sting with. It does possess, in the female sex, a borer for egg-laying purposes, of which I will speak again further on. I have said that the insect has no jaws; it does its feeding—not a great deal in any case—by means of a slender beak arising, apparently, between the fore-legs. By means of this it punctures the tender shoots of trees or vines or bushes of any kind, and sucks up the sap. Whenever a puncture has been made it leaves a little brown spot and if a number are close to-

gether the bark may become hard and discolored. So little feeding is done, however, that it is only after close search that the minute punctures are found in any number. It is physically an impossibility for the Cicada to bite off even a single leaflet, or to swallow even the smallest fragment of solid food. One of the features of a "locust" invasion is the deafening noise they make all day long and well into the evening. It is a peculiar song, compared to a long drawn-out "ph-a-a-a-rao," the sound dropping on the last syllable and most intense on the a-a-a. If we investigate the living specimens to find how the sound is produced, we note at once that not all the specimens are musical, and soon we find that only the males are noisy; that the female could not if it would, utter a single note, however harsh and discordant. We find, in the males, if we hold up the wings and stretch the connection between the thorax and body a little, a convex, ridged membrane on each side. If we kill the specimen and separate the body entirely, we will find two sets of tightly stretched membranes, regulated by heavy bands of muscles.

The abdomen is almost entirely empty and acts like the barrel of a drum as well as to supply air pressure. A large opening from the respiratory system of the insect opens on each side, almost against the convex ridged drums already spoken of, and through these openings, or spiracles as they are called, a current of air sets up a vibration, intensified by the membranes and the hollow body. In the female no trace of this structure is visible; but we find instead a stout, stiff, boring apparatus lying in a groove which extends from the middle to the tip of the underside of the abdomen. This borer or ovipositor is about the diameter of an every day pin and enlarges into a lance-like knob at the tip; this dilation or enlargement being ridged with oblique grooves. If we examine further, we find that this borer or ovipositor is made up of four distinct pieces sliding one upon the other, by a "T-rail" device. This gives a sufficient range of motion to enable the insect to force the structure into the soft wood of young shoots of a great variety of trees, first one side and then the other being moved deeper into the wood. As the ridges at the tip of the ovipositor face backward, they pull out little slivers of wood every time they are withdrawn, and this gives the Cicada egg-puncture its peculiarly ragged appearance. The eggs are laid in rows in the cavities made in the twigs, and there they remain for some time, probably about two weeks, before hatching. It is in this process of laying eggs that the Cicada does the only injury of which it can be justly accused. As a rule the punctures are so deep that the twig or branch wilts and dies or, if that does not occur, the first heavy wind breaks it off. Ordinarily this means a tolerably severe pruning on old trees; but two young stock or nursery trees it is more serious and sometimes means a spoilt tree or one that is put back a year or two. No other or different injury is or can be done by the Cicada. The adults appear during the last days of May and remain with us until near June. The young hatch sometimes in July and at once make their way under ground where they at once disappear and are not again heard of for seventeen long years. The eggs are shown at *e*, and the general appearance of the larva at *a*. The food of the larva is found on the roots of a great variety of trees which are punctured to reach the sap. So slowly do the insects grow, however, and so little do they eat that their presence is not noticed, even if they are very numerous. They dig down for quite a long distance,—how far we do not certainly know; but far below frost at any rate, and they do not again approach the surface until they are full grown. They then change to pupæ in the Fall preceding the year of their emergence, and in March are turned up by the plow in infested districts.

When they are ready for the final change to the adult form they crawl out of the ground late in the afternoon or early evening, climb up the nearest tree, shrub, fence or stone, and shortly after dark the skin of the pupa splits and the perfect winged insect emerges, snow white at first, but soon darkening to its natural colors. As a rule the pupæ emerge from the ground at the surface through perfectly round holes about half an inch in diameter; but occasionally they build extensions of their burrows above ground to a height of from one to four inches. These are called "chimneys" or "houses" or "tents," and their use is still problematical. In several localities in New Jersey these chimneys occurred in great numbers during the spring of 1894 and attracted a great deal of attention.

It is not uncommon to hear the assertion that there is no such thing as a "Seventeen-year locust" and that the species appears at irregular intervals and almost every year in some part of the country. The observations are correct, in most instances, but the conclusions are wrong. As a matter of fact we have in the United States no less than than twenty-two broods of this in-

sect, each brood appearing at regular and invariable periods; but two or even more broods may occur in only one locality, while in a State even as small as New Jersey, four broods are recorded. Brood No. XII is the one that appeared in New Jersey in 1894, and it covered the entire State, in patches from Cape May to Sussex County. This brood occured last in 1877, and we need have no doubt of its re-appearance in 1911. The other large brood known in our state is XXII, which appeared last in 1885, is due 1902.

It only remains to note that in the Southern States the popular "seventeen-year locust" becomes a misnomer, because there the transformations are shortenad so as to occupy thirteen years only. This difference in time is probably due to the much longer warm season in the southern portion of our Country.

Evil Effects of Drifting Sands Along the Jersey Coast.

BY CHARLES S. DOLLEY, M. D.

Few examples of the beneficial results of intelligent tree culture are more striking than those presented in the Danish Island of Seeland and of the districts of South-western France along the Biscayan Shores.

At the founding of Copenhagen on Seeland in the eleventh century, the island was clothed with extensive forests, while a rich alluvial soil afforded fine opportunity for the growth of a large and prosperous community. For some three hundred years these conditions remained unchanged and undoubtably contributed largely to the growth of one of the finest capital cities of Europe; but gradually, the natural forest lands passed from government control into the hands of private owners and, as is the universal rule in such cases, quickly disappeared before the woodman's axe. As a result the drifting sands of the North Shore, previously restrained by the forest belt, began an unhindered encroachment on the cultivated lands, moving in the course of two centuries several miles inland, burying in their progress whole villages and threatening the speedy overwhelming of the entire island. The inhabitants of Seeland found staring them in the face a catastrophy more sure and extensive than that which afterwards visited Copenhagen under the bombardment of Lord Cathcart.

The emergency was, however, not without its value, resulting as it did in one of the most instructive object lessons ever presented in reforestation.

About the middle of the eighteenth century, the tree-planting was begun on these drifting sands and at the present time they are held in bondage by extensive forests of oak and beech.

A like lesson is to be derived from the history of the maritime departments of Gironde and Landes in Southwestern France, a district which for centuries was well wooded and fertile, supporting a large and thrifty people of Iberian and Spanish blood.

In the disastrous results of wastefulness in the use of timber, history here repeats itself inso-much that many thousand acres of this once fertile region became in the course of two or three centuries a sandy plain, covered with thorny shrubs among which the shepherds could only pass comfortably on stilts as they watched their little flocks of sheep cropping the meagre herbage. Here again, within the last half century intelligent forest culture has restored the land to its primitive state, with splendid pine and oak forest and grain bearing fields.

It would scarcely seem possible that in our own country, so recently a land of virgin forest, the history of Seeland and the "Landes" of France could be duplicated; and yet, such is the case in several most interesting localities along the sandy shores of the Atlantic.

Jarcow, in his recent work on "Forest Planting," points out an example of the evil effects of felling the protecting belt of timber along the shore, as follows:—"At the South side of Long Island there were, some thirty years ago, pine forests behind the dunes which with the increasing improvements on Coney Island, Rockaway Beech, etc., have been felled. Since that time, the wind commenced to carry the sea sand into the interior of the Island, and now farmers living four miles distant from the coast complain that the sand borne inland by the wind increases from year to year upon their fields, and threatens to bury entire farms in the course of time."

At Avalon, Cape May County, New Jersey, perhaps as well as anywhere in this country, may be seen the effects of drifting sands. There, great dunes, rising in picturesque billows to the height of thirty and forty feet above high water mark, extend for miles along the coast, and the process of encroachment, and the retarding effect of forest, may be watched in all its phases. The visitor, walking along the crest

of one of these sand waves, any breezy summer day; with the myriads of scurrying grains sifting into his shoes and pockets, and at times almost blinding him as they whirl into his face and eyes, is filled with a feeling of wonderment. He sees, about him all the appearances of drifting snow, but with the sense that no springtime sun will ever bring back to life and foliage the thousands of trees about him raising their bare and gnarled trunks and branches from the flinty waves which have engulfed them. To the west, he looks out over the tops of a luxuriant forest, the nearest trees stunted and compact in growth, their flattened tops trimmed by the sand-blast as close as if shorn by the shears of some conventional garderner. The bank of sand stops abruptly, and he may slide knee deep down its landward side, and step out into an almost tropical growth of vegetation. Protected by the great dune, he finds about him an abundant and varied flora, producing color effects which make the place the delight of artists. Here are the rich red berries and glistening leavesof the holly, the deep, dark green of the red cedar, and the sassafrass, the magnolia, the wild cherry, the tupelo or black gum and the oak, all festooned with a growth of gray lichen, and giving support to a luxurant growth of wild grape vines, green brier, woodbine and the trumpet creeper. In the midst of all this profusion of vegetal life, he looks up and beholds impending desolation, the half buried trees fling out their scrawny arms from the dune above him, and the wind moans a dirge as it drives the hurrying sand and pours it in miniature casades down the encroaching embankment. On this Island of Avalon, as full of wonders to him who has eyes to see, as ever was that enchanted Avalon of Ogier the Dane and Morgan de Fay, was once a flourishing settlement—of which still remain the great old farm house, with its outlyng smoke-house, bake-ovens, barns and sheds, connected by walks made of the hatches of stranded vessels. Here was dispensed, aforetime, a bountiful hospitality as is evidenced by the great metal platter and covers and odd pieces of mahogany furniture still to be seen in the old house; but the adjoining mowing and corn-fields have become miniature "Landes," producing course and thorny pasturage sufficient for but a few head of cattle, in place of the numbers which tradition tells, were at one time bountifully fed, and whose descendants were to be found runping wild on the island not more than twenty years ago

Passing southward along the Atlantic coast the same picture is frequently repeated, strikingly so on the islands lying off the Eastern Shores of Wicomico and Worchester counties in Maryland and Accomack and Northampton Counties in Virginia.

On Hog Island, now owned by the celebrated "Broadwater Club" and disignated by the more euphonious name of "Broadwater" Island are to be found abundant evidences of past fertility and the former existence of heavy forests. Numerous heaps of bricks, half buried in the drifting sands, indicate where once stood the the wide chimneys and broad fireplace, of a wasteful and improvident people. From the throats of these chimneys ascended the smoke of the protecting forests which so long held back the sands and made the island a place of delightful peace and plenty,—a condition which, under the wise management of the present owners is in a fair way to be restored in the very near future,

Is it necessary that we should learn forest management and economy only by the repetition of the costly lessons we have here presented, or are we prepared to accept what has been so well demonstrated? The people of South Jersey have much to learn in the matter of reclaiming drifting sands and sand waste, but the sowing of coarse seeds and grasses, such as the sea sand-reed and rye grass, (*Calamagrostis arenaria, Arundo arenaria, Elymus arenaria, etc., etc.*) is one of the first steps. Later on a growth of myrtle bushes, pines, cedars, junipers, and poplars may be readily started. Right here, bearing in mind the mildness of the climate of South Jersey I wish to call attention to the possibility of planting successfully the various species of tamarisk, (*Tamarax Gallica, T. articulata.*) These are beautiful feathery shrubs or trees, which flourish in salt air, even attaining vigorous growth when so near the surf as to be frequently drenched with the flying spray.

The Colony of Russian Refugees at Woodbine, N. J.

BY H. L. SABSOVICH.

When called by wire from Fort Collins, Colorado, where I was employed as Second Chemist at the State Experiment Station, to manage the Agricultural Schemes of the Trustees of the Baron De Hirsh Fund, little did I expect to spend my energy upon improving the

so-called pine-barren and scrub-oak lands of Jersey. After three years of hard pioneer work I have discovered that only a small quantity of the land in South Jersey is unfit for cultivation. Every inch is available either for general farming purposes or the growing of special crops, such as the cranberry, sweet potato and willow, and for the production of forests which will yield not only fuel and lumber but valuable minor products.

The soil on which our colony is located consists of a mixture of sand and clay. Out of 5,300 acres the soil of 1,800 acres is a clayey loam. The sub-soil is a clay loam mixed with gravel, which is porous enough to absorb the surface water but dense enough to hold fertilizers and manures.

The tillable layer of our soil being two-thirds a sandy loam does not require great expense on tools and horse power. All work can be done with one horse after the surface is cleared of blind stumps and rubbish.

The reckless management of our forests in respect to fires has impoverished the soil by burning the vegetable mulch on the surface. It will require years of careful cropping to reestablish this wealth of organic matter. We shall appreciate this loss only when we are forced to farm these oak and pine lands.

Our shores are fringed with resorts and Philadelphia and New York are near, being greedy markets for truck and fruit. Though yet a young citizen I have studied enough the agricultural resourses of South Jersey to predict for it a great future in the way of truck and fruit growing.

Our soil is light and warm. Our Spring opens two weeks earlier than in New York. Being located between two large sheets of water, the Ocean and Bay and if by the efforts of the State officials and the Woodmen's Association a certain percentage of this part of our State can be kept in healthy forest, we cannot suffer from extreme drought or cold.

Such is the value of the place which was chosen by the Directors of the Baron De Hirsh Fund for the location of a trial colony of Russian refugees after investigating several hundred thousand acres of land in Connecticut, Long Island and in different parts of Jersey. They were sorely oppressed by the Russian Government and have come to enjoy the liberties of America and to become Americanized as rapidly as possible. The people selected to till the soil of Woodbine farmed to a certain extent in Russia having been tenants on large estates or inhabitants of villages.

The Jew in Russia, like during the Middle Ages in all Western Europe, is denied the privilege of the birthright of man to own or even to rent land or even to live among the toilers of the soil—the Russian peasants. Nevertheless there are spots in the South and the Southwest of the Russian Empire, where by the caprices of the autocratic Nicolas the First, some one hundred colonies of Jews were founded. Besides this the Polish Magnates, owners of hundreds of thousands of acres of land and whole villages, have permitted the Jews to live on their estates and in their towns and to rent small areas of land. Under the May laws of 1882 all agreements with the Magnates were declared void by Imperial Decree and thousands, yes, hundreds of thousands were expelled from villages and estates and have scattered over the face of the earth. A large part of the inhabitants of Woodbine were these villagers.

Although unaccustomed to farming among stumps and unacquainted with fruit culture, except grape growing, the farmers of Woodbine with zeal and patience under the guidance of our neighbors are now just beginning to realize the fruits of their labors and thanks to that great financier and philanthopist have bread and happy homes with no fear of despotic rule. Our neighbors met us with distrust as foreign invaders but the cash freely distributed to those who worked for us during the months of August, September and October of 1891 inspired confidence so that they have willingly helped us to clear about six hundred acres of land in town and on fifty farms.

In the middle of the tract eight hundred acres were set aside for a townsite; the balance, 4,500 acres are divided into fifteen acre squares, two of which form one farm. The streets of the town are wide, with room for lawns and ample sidewalks along which several varieties of trees have been planted.

The farm-houses are of simple architecture but comfortable costing from $450 to $550.

The houses in the town are of more elaborate construction costing from $800 to $1,200. There are at present thirty-three dwelling houses in the town, a hotel and two factories. On the farm there are sixty-six houses each with about two and a half acres of fruit trees and berries.

The first agricultural year 1892–93 was devoted to clearing the land and planting fruit trees and small fruits. During the season of 1893-94 our soil yielded from 50 to 75 and even 125 bush-

els of potatoes to the acre, and during the present season in spite of the drought has produced fair crops. Even tobacco has grown virgorously planted on the sod of crimson clover, the clover yielding two tons to the acre. We hope next season to be able to raise two hundred acres of tomatoes and one hundred of sweet corn for the canning factory which is to be erected during the Winter. We have raised onion sets for one of the largest seed houses in America—one hundred and twenty to one hundred and fifty bushels to the acre.

If we cannot yet compare our farms with those of our neighbors we can boast of our roads and schools. We hope, however, by judicial mechanical work and by the application of artificial fertilizers and green manuring to accomplish this shortly.

We have a kintergarden for children from four to six years of age and a school for children from seven to fourteen. A building for the purpose with plenty of light, air and warmth has just been completed. To the usual course of the Public School sewing, wood working, free-hand drawing, water color painting and clay-modelling have been added. For children over fourteen industrial and agricultural opportunities are offered. To meet this demand a farm of thirty acres has been prepared where during the last Summer from twenty to twenty-five boys between fourteen and eighteen years of age have been working. An Agricultural building with lecture room, shop, tool-room, forcing house, green-house and the like, was erected for the purpose. Their education has been mainly practical with little theory because of difficulty with the English language. Most of our boys are now able to understand a popular scientific lecture. Although our Agricultural School has only been in operation one year two of our brightest boys were admitted to the Agricultural College at New Brunswick. These two pioneers of Jewish Agriculture will be of great help to us in the future.

Farming, including forestry, has become an art founded on scientific principles. It is no longer a fool's business and for that reason ought to become a part of our public instruction, in rural districts at least.

Besides the six hundred acres for farming purposes there are four hundred acres cleared for lots, streets and roads.

The number of residents varies here, as in every new settlement. There were times when we numbered seven hundred. Our population for 1894 was about five hundred souls.

We have no manufacturing industries of very great size but small ones which we hope to soon enlarge and improve. I allude to the basket factory and machine shop. We have tried to grow the Osier or basket willow with considerable success and intend to plant five acres more next Spring. It will grow on land otherwise useless although it costs from one hundred to one hundred and twenty dollars an acre to clear it, but the first few crops will repay the outlay.

The machine shop although begun on a moderate basis is our hope of preparing a class of skilled labor for our settlement which is necessary for the wellfare of every place. The shop contains machines and tools worth $1,500. The steam heating apparatus in the Public School Building and the Agricultural Building was constructed by the boys in the mechanical shop. They also built several of our houses.

The religious and social as well as the physical needs of our people are not neglected. There is a congregation and several societies.

The religious services are now held in a room in one of the school houses but the people have decided to build a Chapel as soon as possible. A public bath of brick and iron was erected last Summer by the Woodbine Brotherhood at a cost of $2,300 or $2,400. It is a Russian and Turkish bath fit not only for every day use but for medical treatment as well.

The factories, hotel, office and some streets are lighed by electricity.

About twenty acres of nice young timber have been reserved for a park. It is called Lincoln Park and many of our street are named for great American Statesmen. Three groves have been cleared of dead limbs and otherwise carefully cared for and five breaks have been cut around the town and farms.

I have yet to mention the generous man who contributed the money for the establishment of Woodbine. He is known to all as Baron Maurice De Hirsh. He has proven by his great sacrifices that he is a great philanthropist as well as a great financier. There have been great men among the Jews but at present none excel De Hirsh in benevolence. In the eyes of the Rusaian Jew he is a modern Moses, who has freed them a New Pharaoh—the Russian Czar.

The contribution of DeHirsh for the establishment of colonies in Argentina and the United States amount to millions of dollars. The distribution of this fund in this contry is in the hands of prominent American Hebrews.

Causes and Effects of Forest Fires in the Southern Interior of New Jersey.

The question of fires in South Jersey demands immediate attention. It is the main cause of forest deterioration and its conquences and the impoverished condition of a large part of the Southern Interior of New Jersey. There are very few stretches of woodland in this region which have not been thus effected.

The causes of forest fires may be classified as follows :—1. Incendiaries; 2. Careless individuals; 3. Locomotives; 4. Lightning.

The most serious fires are usually those which are purposely set because set at the proper time in the proper place. An incendiary bent upon mischief waits until the wood is dry and the wind in the desired direction. There are usually two motives back of incendiarism—first, individual gain at the expense of another—second, revenge. A few years ago it was not uncommon for colliers to fire a wood in order to buy it cheaply. The charred wood is then only fit for charcoal. Owing to the decline of the charcoal industry and the abundance of charred wood in the forest this is not practical at present. Fires were set in meadowy regions to improve the grass for cattle. Savanna lands are still burnt for that purpose in regions where cattle are turned into the woods. Berry pickers set fire to huckleberry bushes to improve the berry crop. In a couple of years the young growth which follows bears larger and finer berries. Wood thieves, it is said, set fire to the brush and stumps to hide their tracks. There are many people living in the woods of the Southern Interior who own no woodland but who gain a livlihood in a variety of ways out of woods which belong to other people. They are mostly berry pickers, hunters and wood-choppers.

Fires are set out of spite. If a backwoodsman thinks himself wronged by a woodland owner he "gets even" by touching a match to his woods. It is certain that for several purposes forest fires are set. Such fires do much damage and such people are difficult to convict.

Woodland owners during forest fire season feel insecure expecting a fire at any moment. The incendiary may set a fire to injure an enemy, the wind may suddenly change and many others may suffer in consequence. Several fires in Atlantic County were set last season in the same region several nights in succession.

Second in importance are fires caused by careless individuals. In cleriang land fires escape from burning brush. A large foreign element has come to South Jersey to clear farms. This increases the danger from fires while the land is being cleared. Tramps, hunters and boys with camp fires, lighted cigars and cigarettess cause many fires.

Locomotives are also often blamed. It is certain that many fires have been set by sparks from the stack and hot coals from the grate. The majority of the roads are using some care. On some roads engineers are cautioned, safety strips are cleared and in one instance furrows have been ploughed along the road and section men usually endeavor to put out the fires which are thus caused. If engineers are careful, if the spark arrester is not withdrawn or poked with holes, if coals are dumped in places prepared for that purpose and if safety strips are cleared and furrows ploughed along the road and section men are watchful and willing there is little danger from that source. It is certain that some railroads are using more precautions at present than woodland owners themselves.

Although not common, fires have been set by lightning. Certain species and solitary trees are more apt to get struck than others, There are several indications that a disastrous fire was set last Summer in South Jersey by lightning which struck a solitary tree in a field of dry grass.

The effects of fire may be classified as follows: 1. Destruction of timber and other property; 2. Extinction of valuable species; 3. Impoverishment of soil; 4. Destruction of seeds and game; 5. Consequential damage by effecting industries dependent upon the woods, and by changing moisture soil and climatic conditions which are more or less dependent upon a forest cover.

The amount of damage depends of course up on the severity of the fire which in turn depends upon the dryness of the wood, the force of the wind and the nature of the trees and underbrush. Often everything above ground is killed. The charred boles of hundreds of trees fall and rot in the woods. In low ground after a fire fresh green underbrush soon appears. High land recovers slowly often remaining bare for many years. There is danger from fires about six months of the year. They are very destructive during the high winds in the Spring when there is little sap in the wood. Dry leaves cover the ground and many cling to the low

oaks. Certain trees are effected much more than others. This depends mainly upon the nature of the bark. Often large pine trees appear to be but slightly effected by a groundfire which burns the underbrush and leaves on the surface. Bark is a nonconductor of heat, but if the cambium, the active part of the tree just beneath the bark, is effected the tree dies. Even then if it happens in Spring the tree appears to be recovering. Dormant buds in the trunk sprout and fresh green leaves are formed. It is better to cut such trees at once because they soon die. When the starchy matter in the trunk is exhausted these sprouts wither and die, the tree is invaded by insects, rots and topples over. Even a pine log if cut in the Winter sends out fresh shoots from dormant eyes in the Spring. Even if the tree is not itself directly injured its supply of nutriment and moisture is effected by burning the undergrowth.

The value of underbrush must not be underrated. Although it smothers young trees it is useful to forests of larger growth. The amount of mineral matter which a tree absorbs is insignificant. Water is the essential element. In checking evaporation and retarding the flow undergrowth is often necessary. But the smaller amount of dead wood in a forest the better, since it breeds many kinds of insects some of which may invade the living trees. The material resulting from decay, however, enriches the soil so that it is better to burn the dead wood which cannot be utilized. In that way the soil is enriched just the same, the insects are disposed of and the underbrush is not seriously disturbed. It is easy to see how, therefore, fire in a forest is often useful if wholly under control and directed by a forester. In old pine woods on upland there is often little underbrush. The ground is covered with a thin layer of pine leaves. Stump holes are common in such woods. When a pine tree is cut or burnt the stump decays and a hole of considerable size with many ramifications is formed. The ground is often riddled with holes from suppresed trees. These drain the water from the surface. This together with the slight shade of pines and lack of underbrush accounts for the dryness of the soil and atmosphere in a pine woods. Many trees are soon effected by removing underbrush. The growth of a young oak grove can be easily retarded by trimming the lower limbs and removing the undergrowth.

Since one species is effected more than others a kind of selection continues which accounts for the peculiar distribution of trees in certain places. Thick bark trees and trees which produce a vigorous second growth survive the longest. Pitch pines and oaks therefore predominate in South Jersey while in isolated positions protected from fires a great variety of trees may be found. Certain plants although covered with a thick bark contain substances in the form of resin, oils and waxes which are inflamable. Others contain substances which have a tendency to quench fire. The sowing of such plants along safety lines has been suggested to prevent the slow but destructive groundfires.

The white cedar (*Chamaecyparis thyoides*) the most valuable timber tree in South Jersey and one of the most valuable in America, although growing in wet swamps is often seriously damaged by fire. The heat, although it may not burn, is often sufficient to kill the cedar. In unusually dry weather fires burn for many days in the bed of a swamp. It is often necessary to dig deep trenches in order to check its headway. It destroys cranberry bogs in a similar fashion. For fear of fires cedar is cut when fit only for rails, hop-poles and lathes.

The soil is much impoverished by fire. It is the testimony of a large majority of farmers. The "life" is "cooked" out of it, as they say. The organic matter in the surface soil is often entirely burnt. The surface is bared so that the soil is soon completely leached. Prof. F. H. Storer in "Agriculture" says: "within porous soils nitrates are doubtless formed rather freely, and, as is well known, the nitrates are easily washed out from soils, and are liable to go to waste after every rain that is long continued. They are in fact leached out of the soil, and the manure from which they came rapidly wastes away. It is said to be a matter of old and familiar observation in Germany, that in sandy regions in seasons that are particularly wet the soil may finally be so thoroughly leached that it becomes unfruitful." When we consider the facts that nitrates are easily washed out of the soil, that they are absolutely essential to plant growth and that they are continually produced during the period of growth from humus by the action of nitrifying bacteria we can appreciate the damage to light soils by fire. Land thus damaged needs very careful tillage and green manuring before it can produce a crop of consequence.

When a pine woods twenty years old is destroyed it may mean many years before the soil

recuperates and seeds are again desseminated. Seeds on the surface are destroyed by fire. Some seeds are seriously effected by slight changes of temperature.

Many animals are also destroyed. In the Spring of the year the young are burnt in the nest. It is not uncommon to see many of the smaller animals chased before a fire. By preserving the forest, the animals dependent upon its fruits are preserved.

According to the statements of several seamen the smoke, and fog which it produces, was a serious impediment to navigation along our coast last Summer.

The total area burned over in South Jersey during the past season amounts to not less than one hundred and ninety-seven thousand acres. No improvement in the forest conditions of a country is possible as long as fires are allowed to burn without any systematic preventive measures. With no assurances whatever against incendiaries and individuals guilty of malicious carelessness the owners of woodland are at the mercy of chance. Wood is usually cut in consequence just as soon as there is a market of any kind. Property in some towns in South Jersey is often endangered. Capitalists hesitate to invest in woodland under such conditions.

If a fire breaks out it is seldom noticed until of considerable size. The owner of the land coaxes and lures a few men to help him fight it. A fire often burns for sometime owing to the fact that competent men cannot be found. Many refuse to fight in the day-time. They wait until evening when the fire is smouldering. Many fighters do more harm than good. These men are generally not paid. Often they are allowed to cut the dead wood. When this is refused the land owner is considered mean and often has difficulty afterward in finding fighters. When allowed to cut dead wood the privilege is usually abused. When a fire once gains headway in a dry woods, propelled by a strong wind, it is difficult if not impossible to check. Such work requires brave skillful men familiar with the region and not chance men picked up here and there. The rapidity of the fire depends of course upon the condition of the woods and the strength of the wind. Although these fires are rapid and although the sparks may fly long distances a stream, spur of swamp, or even a road, are often sufficient to check their headway. Many fires which are very destructive burn without being noticed for sometime.

The method of fighting is by back-firing. After the wind and other conditions have been noted a party goes ahead usually to a road which is always an excellent point of vantage and burns back toward the fire. If possible, furrows are ploughed. The fires meet and the force of the main body of fire is checked or diverted. Back-firing on another man's property to save your own often causes trouble.

This much is certain about fires in South Jersey that back-firing in the proper way is the most practical method of checking a fire and that roads are excellent points of vantage. The clearing of roads for some distance on each side and the burning of safety strips at the proper season are important steps toward the prevention of fires. Were large tracts of woodland divided into compartments, each compartment surrounded by fire-lines there would be less danger. South Jersey is such a mass of woods that when fire once gains headway it travels for miles without meeting with opposition. Fires can be much more easily controlled in South Jersey than in a mountainous region. Sand which is excellent material to fight with is, fortunately, plentiful.

Proper policing by a mounted, organized well-directed force of wardens is necessary. The territory must be divided into parts of a certain size irrespective of political divisions, a warden to a district, with the woods, roads and clearings of which he must become perfectly familiar. He is in fact responsible for that district. Located on a prominence with field glasses one man can control a large area in South Jersey. It must be his duty to enforce regulations and to apprehend and bring to court all offenders. It must be his duty to keep a strict record of fires and other facts concerning the forests of his district. With a corps of twenty-five brave skillful men organized and under one head fires can be reduced to a minimum, if not stopped, in the Southern Interior of New Jersey. These wardens must have the power to call on men to help them when necessary. These men must be under his control and be paid fair wages for their work. Fighting fire is such a disagreeable and laborious job that there is little wonder competent men are difficult to find who will work for nothing. Experience in other countries shows that the presence of wardens has a strong educational influence. Twenty-five good men for six months of the year could be procured for five hundred dollars each, allowing as much again for other expenses, twenty-five thousand dollars would cover the cost of such a force. Considering the damage during the past season there is economy in such a measure.

IN THE PINES IN WINTER.

Photographed by Lightfoot

J. W. Shea, Printer.